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### Author
Beckman, SL



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BerkeleyHaas
Haas School of Business
University of California Berkeley

# To Frame or Reframe:
## Where Might Design Thinking Research Go Next?

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**Sara L. Beckman**[1]

**SUMMARY**
Design thinking is gaining widespread attention in the practitioner and academic literature. Successful implementation has been documented, and its value shown in empirical studies. There is little examination, however, of how design thinking practices fit with other approaches from which firms might choose to frame and solve problems such as agile, lean startup, scientific method, Six Sigma, critical thinking, and systems thinking. By digging into the basic capabilities underlying design thinking, academic researchers might better understand problem framing and solving in general and provide insight for practitioners as to where alternative approaches might be applied.

**KEYWORDS:** cognitive framing, capabilities, creativity, design, design thinking, disruptive technology, experimentation, innovation management, problem solving

What would you do with $5 and two hours? Stanford faculty member Tina Seelig posed this question to her entrepreneurship class. She gave each team an envelope with $5 in it and told them they could plan for as long as they liked, but once they opened the envelope their two hours would commence. In the following class, student teams had three minutes to report on their activities and earnings. Some teams used the $5 to purchase needed materials to set up a lemonade stand or car wash and earned reasonable returns on their investment. Other teams reframed the problem, imagining services they might offer with their two hours of time such as waiting in line for people at local restaurants, and ignoring the $5 altogether. This resulted in greater returns. The team bringing in the most revenue, however, realized that the most valuable resource they had been offered with the assignment was the presentation time they had to report on their results. They created a three-minute "commercial" for a local company and

[1]University of California, Berkeley, Berkeley, CA, USA

showed it during their presentation time, garnering the most sizable returns in the class in advertising income from the company.[1]

This simple exercise gets to the heart of design thinking: the ability to frame and reframe the problem to be solved or challenge to be addressed.[2] As Seelig says, "All questions are the frame into which the answers fall. By changing the frame, you dramatically change the range of possible solutions."[3] In rapidly changing times—such as the present age of digital transformation—the ability to frame and reframe is increasingly critical. Faced with significant disruption, entire industries are being asked to question long-standing, often implicit, beliefs about how they thrive. Philips Lighting, for example, tackled the question "what if LED technology puts an end to the lighting industry as a replacement business?" and companies like TaskRabbit and Wikipedia came about by questioning "what if you can get stuff done in chunks by accessing a global workforce in small increments?"[4]

Many successful executives have exhibited the ability to frame and reframe, and led change based on new frames. Ralph Bahna, former executive at TWA, Cunard, and Priceline.com and founder of Club Quarters was known for his ability to frame problems differently, yielding a range of experiences that persist across the affected industries today. A freshly minted Haas MBA graduate in 1965, he conceived of TWA's Ambassador Class, setting the stage for other carriers to adopt the three-class configuration. With an eye to creating outstanding customer experiences, he established the first instant check-in capability at Club Quarters where guests use their credit cards as their room keys. He exhorted BerkeleyHaas MBA students to question assumptions and to clearly "define what you're doing with as few words as possible. If it takes a page to describe a problem, there are probably five or six problems and you have to prioritize."[5]

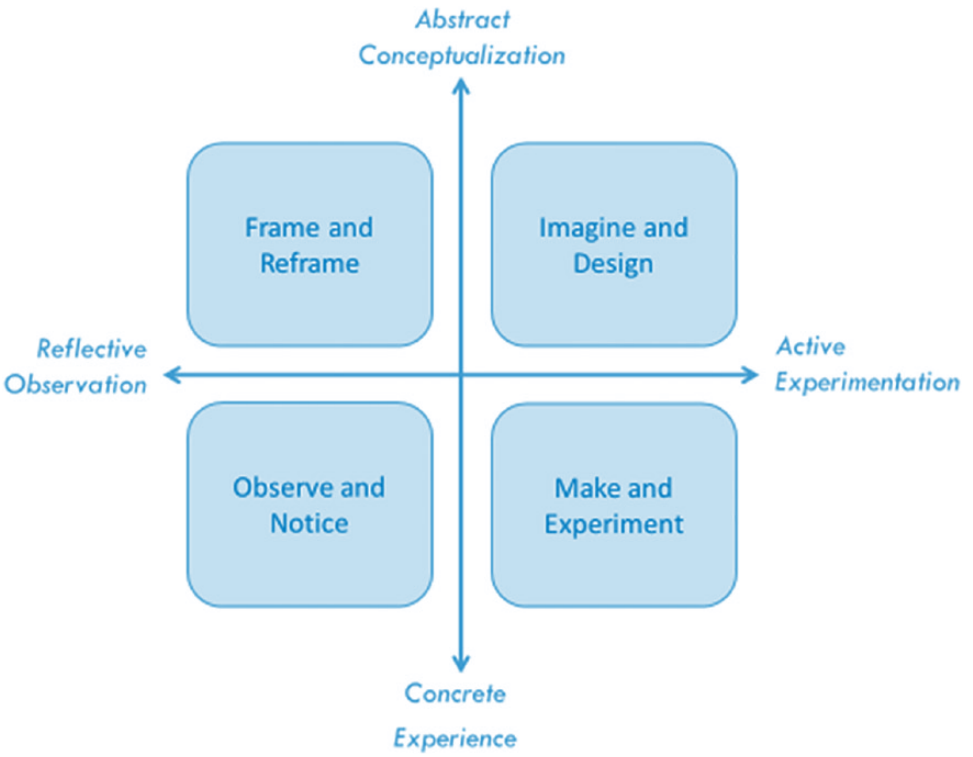
This epilogue to the special issue on design thinking takes a step back to pose questions about where and when design thinking might be most effective in organizations. This is not to question the value that design brings, which has been shown in multiple studies over many years,[6] including those in this special issue. But it is to question under what circumstances design thinking should be a company-wide undertaking, and when it is not, and what other approaches to framing and solving problems might rightly be used.

Using experiential learning theory to frame problem framing and solving capabilities more generally, this article poses questions as to when design thinking approaches might most appropriately be used relative to other approaches such as critical thinking, systems thinking, and scientific method. In doing so, it draws upon the other articles in the special issue and raises questions for both researchers and practitioners about the general practice of design thinking in organizations.

## Revisiting Innovation as a Learning Process

In Beckman and Barry,[7] we proposed understanding design thinking through experiential learning theory.[8] This theory let us outline four core

**FIGURE 1.** Design thinking as a learning process.




*Source*: Adapted from Sara Beckman and Michael Barry, "Innovation as a Learning Process: Embedding Design Thinking," *California Management Review*, 50/1 (Fall 2007): 25-56.

capabilities that underlie design thinking and, more generally, framing and solving problems: *observe and notice*, which happen at the intersection of concrete experience and reflective observation; *frame and reframe*, which happen at the intersection of reflective observation and abstract conceptualization; *imagine and design*, which happen at the intersection of abstract conceptualization and active experimentation; and *make and experiment*, which happen at the intersection of active experimentation and concrete experience (see Figure 1).

The left-hand side of the learning model—the reflective observation work—is the problem-structuring[9] side and is focused on understanding or knowing.[10] The right-hand side—the active experimentation side—is the solution creation side and is focused on making or doing.[11] The Frame and Reframe work, built upon output from Observe and Notice, sets up initial Imagine and Design efforts to generate alternative solutions or futures, and may be altered by learning through the Make and Experiment activities. The questions set up by the Frame and Reframe work are arguably at the heart of effective design thinking practice.[12] As Bjorklund et al. observe (note that hereafter all articles referenced from this Special Issue of *California Management Review* (*CMR*) will be identified with an *

and are listed in the appendix), good design is dependent on creating a mental standpoint from which a problem can be successfully tackled and it is often useful to open multiple frames and hold them open for some time in the search for alternative solution sets.

Thus, we start with a deep dive into the Frame and Reframe quadrant, and then explore the other three capabilities and the ways in which they are driven or supported by it. Along the way, we open questions for further exploration by academics as well as questions managers might ask about how they are developing these capabilities in their organizations.

## Frame and Reframe

Frame and Reframe, which sits at the intersection of reflective observation and abstract conceptualization, is often given short shrift in the popular design thinking press.[13] Many design thinking offerings simplistically use versions of affinity diagramming, mindmapping, and customer journey mapping as tools for framing and reframing,[14] but there are more sophisticated methods[15] that provide for more in-depth exploration of a situation and unpacking of the messy data collected in Observe and Notice. Part of the reason framing and reframing are often skipped is because they are hard to do. Organizations often are structured to support firefighting,[16] rapid resolution of problems, more than they support thoughtful consideration of them.

Problem framing requires intense engagement in sensemaking to develop deep understanding of the problem to be solved or challenge to be addressed. Formally, the literature defines framing as "both as a cognitive device and a communicative activity defined by selection, emphasis, interpretation, and exclusion" requiring "the ability to shape the meaning of a subject, to judge its character and significance. To hold the frame of a subject is to choose one meaning (or set of meanings) over another."[17] (Meaning-making emerges in the "designerly" thinking literature as well.[18])

Framing requires attention to language by classifying, categorizing, and using metaphors[19] or analogous thinking to broaden understanding of a situation. In a project to examine its mergers and acquisitions (M&A) support services, a large consulting firm in Australia determined that being a CEO in an M&A transaction was like Philippe Petit walking the high wire between the former World Trade Center buildings in New York. Were they stringing the wire for the CEO, painting a picture of how great the building on the other end of the wire was, or acting as the balance pole as the CEO traversed the chasm? Working through the analogy allowed them to see elements of their services in different ways and where there were gaps in their coverage.

Framing requires understanding current mental models and developing alternative ones.[20] Organizations struggle with framing and reframing when limited resources constrain attentional focus and routines become embedded in

organizations as "core rigidities"[21] and create a "dominant logic"[22] in a given industry. The rigidities effectively place blinders on the organization preventing it from seeing alternative frames.[23] Some organizations, like Target, have been able to break with existing mental models. Target asked "what if people who shopped in discount stores would pay extra for designer products?" by first recognizing the retail industry's dominant logic that people shopping in discount stores did not care about product aesthetics or styling and then questioning it.[24]

Framing requires priming for spontaneity,[25] which Knight et al.* highlight in the collaborating and conversing practices of executive interaction to create design-led strategy. Framing work engages participants in dialogue involving inquiry, divergence, and convergence. Inquiry forces individuals to uncover assumptions[26] and acknowledge the limitations of their own perspectives. Diverging generates and acknowledges the legitimacy of alternative viewpoints. Converging negotiates meaning, shared mental models and common understanding of a situation.[27] In this way, dialogue intentionally exploits the diversity of perspectives and heuristics in a group,[28] the value of which is also surfaced in Liedtka's* examination of the implementation of design thinking. (Note that the dialogic process of getting to a set of narratives has been deeply explored in the organizational learning literature as well.[29])

The outcome of the sensemaking or framing activities is a set of collective and emotionally connecting narratives or stories[30] that can be readily articulated and then used heuristically to guide decision making,[31] communicative goal setting, and empowerment[32] throughout the organization. This is a point of breakdown in many organizations. A new frame may be selected by senior management or another group in the organization, but it fails in translation to the broader organization or hits so many walls that its proponents stop trying. Ralph Bahna often described the persistence it took for him to convince TWA to try the Ambassador Class idea. Clarity and emotional connection in describing the future experience in a new frame, core elements of storytelling,[33] are critical.

Critical thinking provides the underpinnings of Frame and Reframe activities. Becoming a critical thinker is to undo the unconscious biases absorbed through deep life experiences to understand one's system of thinking and "take charge of the ideas that run one's life."[34] At the most basic level, getting at new frames requires identifying facts (what's real?), inferences (what follows?), assumptions (what's taken for granted?), and viewpoints (what's the filter?).[35,36]

These activities leverage fundamentals such as evaluating information for relevance, constructing plausible inferences, accurately identifying assumptions, distinguishing relevant points of view, and parsing significant from insignificant information.[37] This includes evaluating a broad range of viewpoints and perspectives; maintaining an open mind; accepting new evidence, explanations, and findings; being willing to reassess information; putting aside personal prejudices and biases; and considering all reasonable possibilities or explanations for a situation. Many of the barriers to doing this are identified in Thompson and Schonthal* as social psychological challenges underlying design thinking. Knight et al.* also

identify the challenge for senior executives of having to process a wider variety and different type of data than they are accustomed to in their traditional frame and reframe work.

### *Open Questions about Framing and Reframing*

*Where do or should framing and reframing conversations take place in the organization?* Much of the current design thinking research starts by asking organizations to describe instances of design thinking in the organization and then examines what was done.[38] This special issue describes applications of design thinking to strategy making (Knight et al.*), new product development (Appleyard et al.*), and broadly throughout an organization (Liedtka* and Bjorklund et al.*). In this way, they aim to define what design thinking is thought to be in practice and assess how well it works.

What if, instead, one was to start by asking where in organizations framing and reframing work takes place, what approaches are used to support it, and which approaches are best suited to which types of situations? As Bjorklund et al.* and Liedtka* ask, should design thinking—including the critical framing and reframing activity—be spread throughout the organization? Do all functions in an organization need to frame and reframe problems in the same way? Do critical thinking skills, hypothesis development from observations in a lab setting, or the five whys of root cause analysis also have a place? If so, in what ways might they best be integrated with design thinking approaches?

*How might current approaches for framing and reframing offered by design thinking be deepened to get to more meaningful frames?* Design thinking aims to facilitate the Frame and Reframe work with visualization tools such as mindmapping, affinity diagramming, and customer journey mapping to help sort, cluster, and organize data to unearth patterns.[39] It provides approaches to dimensioning and diagramming data, questioning, reframing, and challenging assumptions to open new possibilities,[40] which embed much of what the critical thinking literature suggests. Liedtka* identifies an additional critical element of this work which is the engagement of diverse perspectives, shown in other literature[41] to be important to innovation outcomes. And Knight et al.* describe the forms of engagement for a team using these methods.

Experienced designers—characterized by their "designerly thinking"—dig deeper with more complex approaches than those put forth by the design thinking community. They, for example, tackle reframing by "searching for the central paradox," attempting to identify what makes the problem so hard to solve. The best expert designers do not address the core paradox head-on but search the broader problem context as well. Often areas that many would consider peripheral to the central paradox trigger the creation of new frames and allow the central paradox to be approached in a new and interesting way.[42]

For example, Dorst describes the challenge of escalating misbehavior in an entertainment district of a large city by the 30,000 or so youth attracted to its bars

and clubs on good nights. Realizing that these youth were well-intended people just looking to have a good time, the design team determined that their challenge was not to increase the presence of security forces as it had previously thought, but instead to reimagine how the youth might be better entertained. Using the metaphor of hosting a music festival, they redesigned the transportation, crowd control, safety, and wayfinding elements of the district, reducing the need for increased security presence.

There is room for research to understand how organizations might make the time needed for the deep exploration required for framing and reframing, and what approaches might be used. Knight et al.* describes one organization's approach to creating the time and space to process the messy data gathered through Observe and Notice work, Frame and Reframe the work, and Imagine and Design options. Methods exist that go beyond mindmapping, journey mapping, and identifying dominant industry practice[43] to facilitate more profound framing and reframing work.[44] How might we build upon existing research on sensemaking and framing to help organizations determine how and where they can best engage in framing and reframing work?

*How are frames communicated and internalized throughout the organization?* Framing and reframing is hard work. Even harder is propagating a new frame throughout an innovation cycle or more broadly throughout an organization. Imagine and Design work often defaults to old frames, particularly in the converging phase. Product managers often report that they are just told what to build with no context provided as to what it contributes to customers or the broader organization. Embedded routines in organizations make adoption of new frames difficult. Additional research on examples of the implementation of new frames in organizations, whether the result of design thinking work or otherwise, will help us understand how new frames are executed.

## Observe and Notice

Framing requires context sensitivity,[45] and thus the Observe and Notice work is an important feeder to Frame and Reframe work. Fundamentally, Observe and Notice is about taking in information from the concrete world. In business, this entails paying attention to political, economic, social, environmental, technical, and other trends (long described in the strategy literature) and embedding with customers, users, and other stakeholders to develop deep understanding of their lived experiences. Indeed, Liedtka* identifies one of the core elements of design thinking as development of deep empathic understanding of user needs and context.

Conversely, conducting Observe and Notice work requires appropriate framing and reframing. Thompson and Schonthal* note: "First, the perceiver needs to *abandon their pre-existing script* or cognitive lens. Second, the perceiver must learn *inductively, via inference*. And third, the perceiver must engage in *finding*

*a pattern*." The most important of these is, perhaps, the first as challenges with abandoning "cognitive lenses" is captured in several other articles in this issue. Thompson and Schonthal* assert,

> The paradox is that the design thinker must first put aside all frames and lenses to first observe and notice and then be ready to experiment with new lenses and frames. This is difficult to do because of the *perseverance effect*, which refers to the fact that once a given frame has been used to interpret a situation, people are reluctant to abandon it.

Liedtka* cites research showing that

> A number of psychological challenges must be surmounted in order to accurately assess user needs. Primary among them is innovators' inability to assimilate new information, which is reliant on the innovation team's interpretation of the situation. Flaws in observations and interpretations lead innovators to attend to specious concepts, render inaccurate assessments of value, and underestimate the most innovative ideas.

Knight et al.* highlight challenges for executive leadership teams whose lives are very different from those of their customers.

In short, frames determine what one can or cannot see while observing and noticing. And data from observing and noticing are a critical input to being able to frame and reframe. Effective toggling between Observe and Notice and Frame and Reframe capabilities facilitates the sensemaking in which organizations must engage to understand the transformations required in this digital age.

The market research and design research methods available for deeply understanding customers have been widely documented and taught for decades. Interviews and observation are associated with exploratory, qualitative research as they seek insight into how products fit with customers' everyday practices, local cultural models, and ideologies that inform purchase behaviors and understanding of products, services, and experiences. These methods are in turn based in cognitive psychology which focuses largely on the use and usability aspects of product design[46] as well as ethnography and anthropology.[47] Quantitative research methods such as surveys and big data analytics have important roles as well, and should be properly integrated with qualitative approaches to learn about customers, users, and their experiences.[48] Crowdsourcing is emerging as an alternative approach to capturing stakeholder needs, information on various trends, and possibilities on which solutions might be based.

In practice, ethnographic research methods are often underappreciated and underdeveloped. The so-called short-term ethnography methods used in many design thinking applications rely on methods that are conducive to rapid, structured data collection such as focus groups and structured interviewing. The shortcuts, workarounds, and insufficient sample sizes often used can lead to unjustified conclusions or claims. The rapid data collection methods are unlikely to capture

the understanding that results from deep participant observation done in the customer or user setting, which requires a more sophisticated skill set less frequently encountered in industry.[49] More sophisticated practitioners exhibit the self-reflexivity needed for participant observation and training that enables pattern identification.[50] While significant investment is being made in customer experience or user experience research groups in large organizations, much of what is taught and practiced as design thinking engages short-term ethnography approaches.

### *Open Questions about Observe and Notice*

*What does a truly customer-centric organization look like? How might a company transform itself to become truly customer-centric?* Upon reviewing the literature on customer-centric organizations, a young Berkeley undergraduate appeared in my office to report how strange it was to her that "customer-centric organizations are not human-centered."[51] This question in various forms has created a flood of research in recent years,[52] in part as it has been pushed to the surface by interest in design thinking. It, however, bears additional attention to probe how and where customer understanding must be embedded, particularly in the decision-making processes of organizations.

In a rare organization-wide view, creators of the Customer Centricity Score[53] measured the extent to which customer centricity could be experienced across all organizational units. This resulted in understanding the elements of leadership culture (e.g., management champions a customer-focused approach by their actions), cross-organization collaboration (e.g., all business units are constantly in contact with customer touchpoints), and customer-centered processes (e.g., the desired customer experience is clearly defined from start to finish and everyone knows their role in the customer experience chain) used by organizations that focus on customers holistically. This work provides a productive set of questions for organizations wishing to become more customer-focused (in a human-centered way).

Much of the other research tends to focus on elements of customer-centricity such as the need to increase flexibility and fluidity within the marketing organization[54] and the development of theories of "outside-in marketing."[55] Additional research is needed to carefully understand the specifics of how human-centered organizations work. How and when do customers show up at meetings (e.g., as personas, in the form of stories, on video), for example? How is the balance between customer-centered and business-driven—a balance apparently well-maintained at Amazon, for example—best managed? This broader understanding will help place design thinking in an appropriate context.

*Where in the organization is customer and user information gathered? How well is it gathered (and processed)?* Customer or user experience design and market research groups are often the locus of data gathering about customers and users in large organizations. Product managers also play a role in bringing understanding of customers and users to development teams. Some executives, exemplified by Howard Schultz (Starbucks), A. G. Lafley (Procter & Gamble), and Ron Shaich

(Panera Bread),[56] interact directly with customers or users to form their own empathic understanding. And, design thinking projects, such as those documented throughout this special issue of *CMR*, are another source of information about customers.

Appleyard et al.* describe understanding stakeholders for a complex piece of equipment being delivered in a B2B setting that involves in-depth exploration of the user environment as well as meetings in which multiple customers collectively negotiate the benefits they wish to see in upcoming offerings.

So, open research questions remain. How well do current research approaches do in gaining deep understanding of not only functional, but also the social and emotional "jobs to be done" of customers and users? How are qualitative and quantitative research methods best triangulated to gain that understanding? How are the methods selected best matched to the context? Who in the organization should be tasked with performing this research? How might the learning about customers that is done at various points throughout an organization be collected to create shared understanding?

*How is the information communicated and embedded in decision making throughout the organization?* For over 20 years, Intel Corporation has engaged anthropologists and ethnographers to explore the markets in which Intel's products are used. Despite working on seemingly esoteric topics such as "fear," the research organization can very clearly draw lines from their research to its implementation in Intel products.[57] The clear connection between research groups such as Intel's and the rest of the organization is often not as well-developed.[58]

If deep understanding of customers and users is being developed somewhere in an organization, how can it best be communicated to others throughout the organization in a way that facilitates their using it to make customer-focused decisions in their daily work? How can everyone in the organization be made aware of their role in delivering a customer experience and have enough understanding of what customers will get from that experience to make appropriate choices on the front lines? In short, how do organizations create comprehensive views of customers and users that are more than numbers on a page, but create emotional connection as well?

## Imagine and Design

Toggling between Observe and Notice and Frame and Reframe determines the problem to be solved or the issue to be addressed. Toggling between Imagine and Design and Make and Experiment on the active experimentation side of the experiential learning model takes the chosen frame and generates solutions or ways to address it, and then experiments with them. Liedtka* identifies this "generation of multiple solutions winnowed through experimentation" as one of the core elements of design thinking.

Imagine and Design, simply stated, entail generating a range of alternatives and then refining, combining, and choosing from among them in part by making and experimenting to better understand or de-risk them. In the process, it is quite possible that new information or understanding will be surfaced that will cause a return to Frame and Reframe for a "pivot" as the lean startup folks refer to it. Thompson and Schonthal* highlight a few of the tools (e.g., brainstorming, brainwriting, speedstorming) used to generate ideas, and the individual-team balance that best supports that work.

There are challenges in the Imagine and Design quadrant. Most insidious is that teams engaged in Imagine and Design, knowingly or unknowingly, revert to long-held, comfortable frames in the diverging process. Design thinking uses "how might we?" questions to bridge these quadrants, which can often lead to significant oversimplification of the insights and frames that emerged from analysis of the messy customer and user data.

> If creativity is loading and unloading, the loading is really hard work and it rarely happens. The notion that we might just get some M&Ms, show a couple of pictures or a video, and then just brainstorm our hearts out frequently means that we are drawing on past models and references that may or may not be appropriate. Worse, we just stay in the frame that is current. It is hard to get a group to see a different way of looking at the world and brainstorm from within that.[59]

Designing against the status quo[60] requires bringing deep understanding of underlying system dynamics, both present and historical, and commitment to cross-disciplinary or cross-functional work.

Metaphors are a useful way in which to bring frames into the Imagine and Design work. Philippe Petit on the high wire was a potent metaphor for the M&A organization to hold as they reimagined how they might work with their clients. It allowed the team to gain a shared understanding of current reality, and then to imagine alternative futures and open shared pathways for development of those futures.[61] It gave the team a means of integrating the elements of a solution (which such "designerly" thinking tools as Morphological Synthesis[62] support), and then of evaluating those elements against intended customer outcomes.

Whether an appropriate frame is held for concept generation or not, research shows that groups are not bad at generating "out of the box" ideas, but that they then vote themselves back to "average" in the converging process. As Liedtka* highlights, "decision makers often make choices driven primarily by a fear of mistakes. Since many possess a mindset that prefers preventing error to seizing opportunity, they choose inaction over action when a choice risks failure." Using comprehensive concept selection methods[63] that are more rigorous than design thinking's "dot voting" can both create explicit connections back to the new frame and allow teams to work with more complex concept constructions thus preventing what one executive referred to as "heaven on a whiteboard."[64]

### *Open Questions about Imagine and Design*

*Where in the organization is or should Imagine and Design work be done?* The simple notion of managing the dynamic balance of diverging and converging employing basic concept generating and selecting methods is clearly widely applicable in organizations. Nonetheless, research shows considerable hesitation, reluctance, and fear among executives and managers to experiment with methods they considered to be "so far out there," "hokey," or "untraditional" relative to their everyday work habits. Once they had executed the experiments, however, the same practitioners expressed surprise and excitement at the engagement they were able to generate among their work colleagues.

The bigger question for customer-centered organizations is who in the organization is responsible for generating an overall picture of the set of future experiences to be generated for customers.[65] The "design roadmapping" process[66] can operate at the strategy level in the settings described by Liedtka* and Knight et al.*, or might readily be used at the product (management) level to capture the experiences to be created by a specific solution family.[67] If customer experience design is happening at multiple places in the organization, how might the various designs best be integrated?

*What approaches to Imagine and Design might best help teams hold new frames?* Creating physical representations of the alternative futures implied by a shifted frame can help teams hold new frames in the ideation process. Although Imagine and Design occur in abstract conceptualization space, creation of physical artifacts facilitates the process because thinking does not happen only in our heads.[68] Instead, "certain forms of human cognizing include inextricable tangles of feedback, feedforward, and feed-around loops: loops that promiscuously crisscross the boundaries of brain, body, and world."[69] The kind of media and the characteristics of the media with which people engage have a profound effect on how they think and consequently on the nature of their conversations.[70]

This suggests that representations of both customers and users as well as the experiences they have presently and those they might have in the future may be critical in holding frames as teams conceptualize. Liedtka* supports this notion in her suggestion that teams engage in creating multiple possibility-based solutions made tangible through prototyping. Knight et al.* provides an in-depth case study of how a senior management team interacted with and processed customer and user information in their strategy-making work.

Experienced designers have long engaged in concept development that goes far beyond post-it brainstorming,[71] but not necessarily all the way to prototype building. In developing concepts for new drive-thru experiences for a fast-food company, senior executives worked with a designer who rapidly sketched their ideas as they threw them out. At the end of the session, instead of a collection of post-it notes, the executive team had a handful of sketches of integrated customer experiences in the drive-thru. Rough conceptual sketches of this sort are shown to facilitate thinking conditionally or roughly, thus experimenting in a

safe way with new ideas.[72] Developing these capabilities, however, is hard. More research is needed to understand how organizations might nurture and implement them.

## Make and Experiment

Make and Experiment operate in the concrete experience space, bringing alive concepts generated during Imagine and Design and taking them back into the real world to see how they work. As Bjorklund et al.* suggest, the act of creating objects such as prototypes or other visualizations of ideas allows not only for representing knowledge but for transforming it, and offers a communication connection for coordinating shared work. Thompson and Schonthal* note that embedded in Make and Experiment are the concepts of play, of rapid iteration, and of learning through experimentation and failure.

The Make and Experiment space is one in which elements of an intended customer experience, such as products or services, might be tested through prototyping. This type of experiment receives the most attention in the design thinking,[73] new product development,[74] and experimentation[75] literature.

But, Make and Experiment can also be applied to testing whether an insight or new frame is correct. Consider, for example, the student who undertook to understand wedding planning challenges. Through an in-depth interview process, she surfaced interest on the part of people to customize their weddings, but fear that their ideas for doing so might not work out. And, she learned that many people felt that their partners were not sufficiently engaged in the wedding preparations. She hypothesized and storyboarded a set of possible solutions that might work for each of these insights and shared them with her potential customers, in the process learning that the customization challenge was real, but the complaints about partners not being involved were just that—complaints. Her interviewees were not really interested in having their partners be more involved. With simple concept sketches, she tested her insights (hypotheses) and eliminated one of them. This type of simple experimentation can help managers overcome the fear of taking on something new or seemingly risky, as identified by Liedtka* and others.

Make and Experiment can also be applied to testing whether customers and users might be convinced to change their behaviors. Consider the energy bar company that wanted to know if people who drank smoothies or other such beverages as their breakfast could be convinced to eat a bar instead. They recruited and paid people who were current smoothie consumers to instead eat a bar for breakfast each morning for a week and then interviewed them about their experiences. In the process, they learned whether the smoothie consumers might be converted and if so, what it would take to do so.

The significant bias toward building what the Lean startup movement calls *minimum viable products* erroneously shifts focus in Make and Experiment work from deeper understanding of the risks associated with an idea or solution and

designing experiments to better inform that understanding. It also detracts from imagining the ways in which insights or new frames might be tested without full solution prototypes. Bjorklund et al.* highlight the differences between how engineers and designers approach prototyping: engineers focus more on validating proposed solutions while designers seek new insights that can be used to frame and reframe the problem to be solved.

### *Open Questions about Make and Experiment*

*How might organizations best create and provide access to capacity for making and experimenting?*

> It is a truism that most managers operate in a changing world where they lack sufficient data to inform their decisions even though we are awash in information coming from every conceivable direction. Consequently, for better or worse, we tend to rely on our experience, conviction, beliefs, assumptions, or intuition. But this all too often doesn't work. And all too often we discover that ideas that are truly innovative go against our experience, intuitions, and assumptions. Whether it's improving customer experiences, trying out new business models, or developing new products and services, even the most experienced managers are often wrong, whether they like it or not.[76]

Testing ideas can both de-risk them and qualify great ideas that might otherwise be put to the side.

Most organizations, however, either don't have well-developed capabilities for conducting experiments or don't provide ready access to the capabilities they do have. The most well-developed capabilities today reside in digital technologies–based companies such as Booking.com, Google, and others.[77] But, even in those organizations product managers often report insufficient access to the testing resources to run experiments at the speeds they would like. Additional attention is needed to determine the best ways for organizations to develop experimentation capability and capacity, and how it can best be leveraged across the organization.

Clorox's innovation lab, for example, was stymied in its efforts to test new brands, products, channel choices, and pricing decisions by the organization's very conservative approach to new product introduction amid fears of damaging its brand. The lab creatively opened a non-Clorox branded site on Amazon, provided product to the Amazon warehouse with plain bags in which to ship various quantities of the product. It could then swap out labels that positioned the product in different ways and change both quantities and pricing on the website. In this way it was able to de-risk the product introduction, making the rest of the organization comfortable with rolling it out more broadly. Development of this kind of experimentation capability will be critical going forward.

*How might the feedback from experimentation best be communicated back into the organization to facilitate the generation of new or alternative frames?* Just as customer and user research must be communicated and processed, using for example the approaches

identified in Knight et al.*, so must results of experimentation. Results of experimentation can also drive new rounds of observing and noticing to deepen understanding of the results of experimentation. Unless the organizational units conducting experiments are the same as those conducting customer and user research, important connections and possibilities for triangulation may be lost.

## Conclusion

Much of the work on design thinking—including that in this special issue—centers around design and design thinking. Thus, it tends to conclude that design thinking must permeate entire organizations as if it is the only or best way to tackle framing and solving problems. What if one simply asks how and where the capabilities associated with framing/reframing exist or are needed in an organization and what they are used or needed for? The answers then become more nuanced. Bjorklund et al.*, for example, suggests that design approaches can help engineers, sales staff, internal services, and management become effective in their own work. Which approaches are most helpful where? How should design approaches be integrated with other approaches to framing and solving problems? Should design approaches replace all other approaches to framing and solving problems? For example, should scientists engaged in pharmaceutical drug development eschew scientific method in favor of design thinking? Or, should distribution centers stop optimizing inventory management practices in favor of using design methods? Where does the use of big data analytics fit?

Without more careful unpacking and deeper understanding of how organizations frame and solve problems generally, academics and practitioners alike run the risk of getting too narrowly focused on a single practice and neglecting the others that might rightfully accompany it. History, perhaps, best signals this warning. Frederick Winslow Taylor, for example, made claims about the development and implementation of scientific management (later called Taylorism) that are strikingly resonant with claims made about design thinking today:

> The same principles [of scientific management] can be applied with equal force to all social activities: to the management of our homes; the management of our farms; the management of the business of our tradesmen, large and small; of our churches, our philanthropic institutions, our universities, and our governmental departments.[78]

Historians eventually put Taylor's work into perspective: "Scientific management took on some of the trappings of a kind of secular religion; Taylor was the messiah, and his followers, who spread the word, were (and still are) commonly referred to as 'disciples.'"[79] Taylor's fundamental notion of a single "best practice" for everything, however, lives on and thrives today in the zeal for design thinking.

Complicating matters for industry practitioners is the drumbeat of calls to try alternative practices—such as lean startup, agile, and extreme teaming[80],

sometimes in combination[81]—in the process possibly giving up established approaches to framing and solving problems like Six Sigma (quality management), and even scientific method. What if, instead, practitioners had at their disposal multiple approaches to framing and solving problems and were able to select from among them those most appropriate to a given situation? This requires deeper understanding of problem framing and solving approaches in general and of where and when design thinking fits among them.

## Appendix

Articles from the *California Management Review* Special Issue on design thinking (marked with an *):

- Tua Björklund, Hanna Maula, Sarah Soule, and Jesse Björklund Maula, "Integrating Design into Organizations: The Co-evolution of Design Capabilities," *California Management Review*, 62/2 (Winter 2020).
- Eric Knight, Jarryd Daymond, and Sotirios Paroutis, "Design-Led Strategy: How to Bring Design Thinking into the Art of Strategic Management," *California Management Review*, 62/2 (Winter 2020).
- Jeanne Liedtka, "Putting Technology in Its Place: Design Thinking's Social Technology at Work," *California Management Review*, 62/2 (Winter 2020).
- Leigh Thompson and David Schonthal, "The Social Psychology of Design Thinking," *California Management Review*, 62/2 (Winter 2020).
- Melissa M. Appleyard, Albrecht H. Enders, and Herb Velazquez, "Regaining R&D Leadership: The Role of Design Thinking and Creative Forbearance," *California Management Review*, 62/2 (Winter 2020).
- Cara Wrigley, Erez Nusem, and Karla Straker, "Implementing Design Thinking: Understanding Organizational Conditions," *California Management Review*, 62/2 (Winter 2020).

### Author Biography

Sara L. Beckman is Earl F. Cheit Faculty Fellow at the Haas School of Business and a Teaching Professor in the Mechanical Engineering Department at the University of California, Berkeley (beckman@berkeley.edu).

### Notes

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